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Potential for Unitization in the Coal Industry of Montana

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POTENTIAL FOR UNITIZATION IN THE COAL INDUSTRY OF MONTANA

A Research Paper Prepared For:

MONTANA TRADE COMMISSION
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April 16, 1976

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POTENTIAL FOR UNITIZATION IN THE COAL INDUSTRY OF MONTANA

INTRODUCTION: SCOPE AND OBJECTIVES

Early in March, 1976, the Montana Trade Commission requested T.A.P., Inc. to prepare an outline for a brief research paper that would address the issue of coal field unitization in Montana. The principal elements to be covered included the investigation of how unitization now applies to the oil and gas industry and what application, if any, the concept could have to a coal field. In April, T.A.P. devoted several weeks to research and evaluation and the results are contained in this report.

This paper will examine the unitization concept as it has applied in recent years to the gas and oil industry, with the specific objective of seeing if there is any applicability to the rapidly developing coal industry in Montana. In order to accomplish this objective, the concept must be looked at and analyzed as it now applies to the oil and gas industry. Research is necessary to determine if in fact coal unitization is in use or has been used anywhere in the nation. Once this background is set, the feasibility of applying the concept in Montana in the mining of coal can be discussed. From these examinations recommendations both for the present and for the near future can be made.

SECTION I. GENERAL INFORMATION ON UNITIZATION CONCEPT

SUBSECTION A. What It Is

PART 1. General Definition

The Law of Pooling and Unitization by Raymond Meyers describes the purpose of unitization as gaining the advantages of a single operator, eliminating competition and duplication of equipment and supervision. This concept has emerged as an accepted and many times required procedure in the gas and oil industry. Another way to look at the unitization concept is to view it as the consolidation of various mineral owners of an area into one unit so the particular mineral can be retrieved in the most efficient way possible.

For example, prior to unitizing in the oil and gas industry, if there were four sections of land, each one of the sections having a unique owner, it was very possible that each of these four owners would drill a well, attempting to claim whatever resource was beneath their land. (Figure 1) They were forced into this due to the Law of Capture, which stated that if you drilled a well, you could extract whatever reserve would drain to that particular drilling site. By unitizing the four sections with four separate owners, there would be one unit as opposed to four. (Figure 2) The reserve could then be drilled with fewer wells. This is a very brief illustration of the unit concept; but in a nutshell, this is how the concept has been able to work.

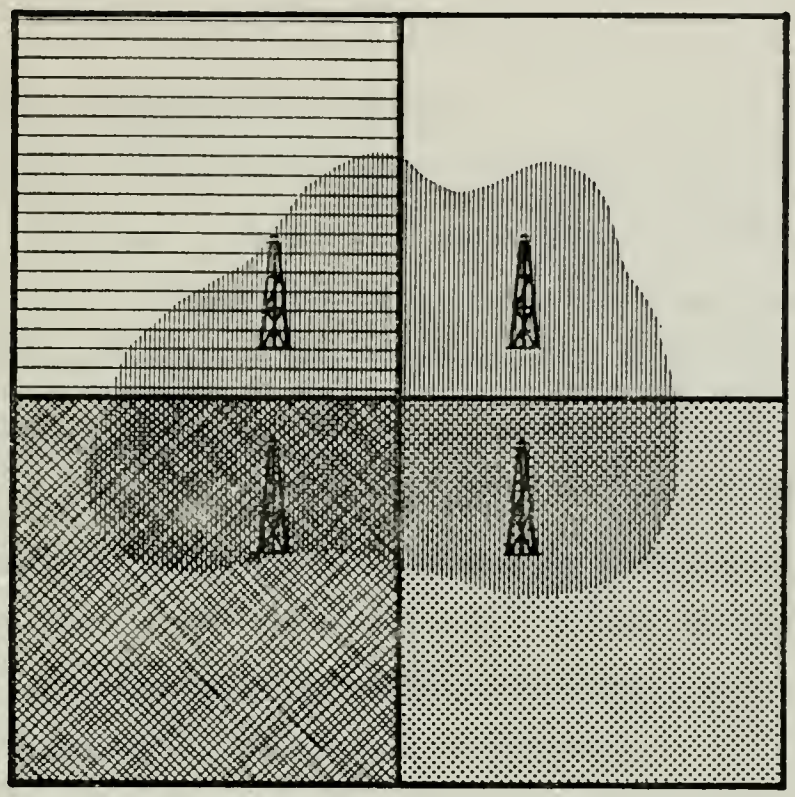
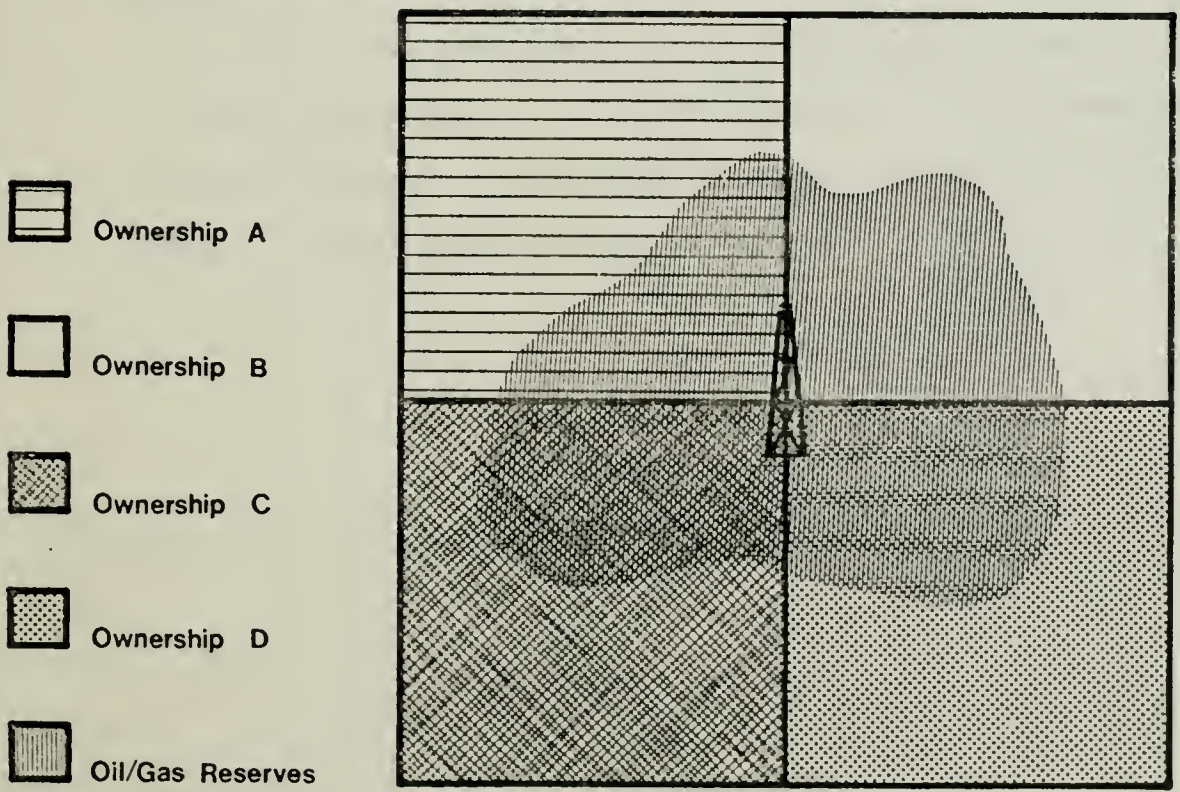


FIGURE 2



Source: T.A.P., Inc.

PART 2. As It Applies to Montana

Montana has used the unitization concept in the development of the oil and gas industry for many years. The Oil and Gas Conservation Commission of Montana has supervised the workings of the industry and has been directly involved in the establishing of units in the state when necessary.

The unitization concept has proven to be advantageous both to the mineral owners and the operating entities. This can be demonstrated by the fact that only twice has the mandatory participation been invoked by the Commission, according to Richard Hug, Commission Supervisor.

PART 3. Difference Between Pooling and Unitizing

The terms are very similar and often times interchanged with one another. The technical difference is that pooling is the grouping together or consolidating of a small number of owners; whereas unitization, in effect, is a combination of various pools. Therefore, a unit actually has a number of pools in its organizational structure.

SUBSECTION B. How Unitization Works

PART 1. Enabling Legislation

The pooling and unitization of oil and gas fields has been in effect for more than 50 years. The advantages of such actions have long been obvious and were so largely because of the geological and physical properties of oil and gas. Their fluid nature, the methods of extraction, and the associated problems gave rise to the practice of unitizing.

Each state that contains oil and gas reserves has some form of a regulatory body charged with the responsibility of administering state laws and rules regarding the exploration, development, and production of these natural resources. In Montana this public body is the Oil and Gas Conservation Commission. They publish a booklet entitled General Rules and Regulations and Rules of Practice and Procedure Relating To Oil and Gas. From this publication the following excerpts and summaries are drawn.

> 102.47 "Spacing unit" shall mean the area that can be efficiently drained by one well, and the size and shape of spacing units are to be such as will result in the efficient and economic development of the pool.
>
> 60-130. Pooling of interest within spacing unit--voluntary or on order of commission after hearing--contents of order.
>
> A. When two(2) or more separately owned tracts are embraced within a spacing unit, or when there are separately owned interests in all or a part of the spacing unit, then the persons owning such interests may pool their interests for the development and operation of the spacing unit. In the

absence of voluntary pooling, within the spacing unit, the commission, upon the application of any interested person, may enter an order pooling all interests in the spacing unit for the development and operation thereof. Each such pooling order shall be made after hearing, and shall be upon terms and conditions that are just and reasonable, and that afford to the owner of each tract or interest in the spacing unit the opportunity to recover or receive, without unnecessary expense, his just and equitable share of the oil or gas produced and saved from such spacing unit. Operations incident to the drilling of a well upon any portion of a spacing unit covered by a pooling order shall be deemed, for all purposes, the conduct of such operations upon each separately owned tract in the spacing unit by the several owners thereof. That portion of the production allocated to each tract included in a spacing unit covered by a pooling order shall, when produced, be deemed for all purposes to have been produced from such tract by a well drilled thereon.

B. Each such pooling order shall make provision for the drilling and operating of a well on the spacing unit, and for the payment of the cost thereof, which cost may include a reasonable charge for supervision, handling and storage. As to each owner who refuses to pay his share of the costs of drilling and operating the well, the order shall provide for payment of his share of the cost out of, and only out of, production from the well allocable to his interest in the spacing unit, excluding royalty or other interest not obligated to pay any part of the cost thereof. In the event that any dispute as to such cost, the commission shall determine the proper cost. The order may provide in substance that the owners who agree to share in the cost of drilling and operating the well shall, unless they agree otherwise, be entitled to receive, subject to royalty or similar obligations, all of the production of the well until

> they have recovered all of such costs out of production and thereafter all of the owners in such spacing unit shall be entitled to receive their respective shares of the production of such well as their interest may appear after deducting their respective shares of current operating costs.

Such agreements between and among surface and subsurface owners and operating entities are specified to be not in violation of anti-trust laws or statutes relating to trusts, monopolies or contracts in restraint of trade. This is as long as the agreement is approved by the Commission as being in the public interest and reasonably necessary to increase ultimate recovery or prevent waste of the natural resource.

After an application by persons owning leasehold interests underlying 60 percent of the surface within the delineated area, the Commission holds a hearing to consider the need for the operation as a unit. All owners are notified and a plan for unit operations is furnished. The Commission will order the unit operation if the following criteria are met:

1. The operation is reasonably necessary to increase ultimate recovery.

2. The value of additional or more efficient recovery, less royalties, exceeds the cost of conducting unit operations.

3. The full extent of the pool of the oil and gas has been reasonably defined.

The plan for a unit operation must include:

1. A description of the unit.

2. A statement of the purpose of the plan along with the proposed unit agreement and unit oeprating agreement.

3. A plan for allocating to each tract and/or owner, the fair share of oil and gas produced.

4. A provision for the credits and charges to be made among the owners in the unit for their respective equipment and well investments contributed to the unit operations.

5. A provision providing how unit costs will be determined and charged to owners.

6. A provision for the supervision and conduct of the unit operations including voting weights.

7. A provision for the possible challenge of the unit operator by any other owner in unit.

8. The unit commencement date and procedures for unit operation termination.

9. Any other provisions that are found to be appropriate.

No order by the Commission setting up a unit will become effective until the plan has been approved in writing by those persons owning at least 80 percent of the production or proceeds and by those required to pay for at least 80 percent of the costs of the unit operations. If a unit is so approved, any disapproving owner is made a part of the unit and then involuntarily participates in the unit.

PART 2. Organizational Structure

The organizational structure of a common unit consists of a Unit Agreement. This Unit Agreement is then made up of an Operators Agreement and a Royalty Owners Agreement as well as various committees. The Law of Pooling and Unitization defines these agreements in this way.

> The Operators Agreement, as its name implies, is an agreement among the working interest owners or owners of leases only, called by definition "operators." The Royalty Owners Agreement is an agreement executed by the operators and the royalty owners. Only the Royalty Owners Agreement is placed of record.
>
> The Operators Agreement normally contains only those provisions that affect the operators, and the Royalty Owners Agreement only those provisions that affect the royalty owners.

For the purpose of this paper, we are using the term surface and subsurface owner to include the royalty owners.

The Royalty Owners Agreement and the Operators Agreement are similar in design and content. Many of the concerns of one are actually concerns of the other. There are, however, some points in the Royalty Owners Agreement that pertain specifically to the surface and subsurface owner.

Some of these concerns are the extent of their participation of plant products, the manner of treating acreage outside a unit where part of a lease is within and a part without the unit, the subject of easements, and in some cases the program of development, and the method of recovery operations.

The Operators Agreement is also well defined in the Law of Pooling and Unitization.

The three main purposes are:

> 1) Each operator whose name is subscribed to this agreement owns and is entitled to search for and to produce oil, gas and other hydrocarbons from certain tracts of land included in the field, as hereinafter defined.
> 2) This agreement is entered into to establish a pooled or unitized unit for said field necessary to effect. . . maintenance, . . . recovery, and other . . . operations and to establish and operate co-operative facilities necessary for such operations.
> 3) It is also the purpose of this agreement to establish such unit plan of development and operation to the end that the resources of said common field, pools, zones, or reservoirs may more properly be conserved and that underground and surface waste may be prevented and that the maximum recovery of oil, gas and other hydrocarbons from said oil and gas bearing reservoirs in said field may be achieved.

The various committees which are set up are dependent upon the specific unit and its requirements. Some of the more common committees in an established unit might be:

> (1) Plant--This committee was instructed to study the basis for the evaluation of the plant and its inclusion in the unit as a unit facility.
> (2) Well and Lease Equipment Evaluation--This committee was instructed to determine the basic factors for use in evaluating the physical properties and determine the manner in which these data would be used in the unitization formula.
> (3) Accounting--This committee was instructed to prepare an exhibit to the proposed unit agreement designated "Accounting Procedure" which sets out the method of accounting to be used in the unit agreement.
> (4) Legal--This committee was instructed to handle the legal problems arising in the negotiation of the agreement, draft the necessary instruments, and to advise on all legal problems generally.

It becomes apparent examining this organizational structure of a unit, that the overall intent is the advancement of mutual interests. This structure does not allow an unfair advantage to exist.

PART 3. Royalty Participation

The royalty participation within the unit is determined by formulas. Without getting into specifics, this excerpt from Raymond Meyers' text on unitization highlights the concept.

> The formula is the heart of the unitization agreement. It is usually the most difficult problem to solve, but unitization is impossible until it is agreed upon by the operators. The formula determines the portion of the unitized substances each participant is to receive, and is usually arrived at only after long and laborious negotiation. The ideal is that each operator's share of production from the unit shall be in exact proportion to the contribution which he makes to the unit.

The actual participation is unique to each unit. These formulas for participation are outlined further in Section II, Subsection G.

SUBSECTION C. Present Application to Gas and Oil Industry

PART 1. Advantages to the Surface and Subsurface Owner and Operating Entities

Both the surface and subsurface owners as well as the operating entities have experienced some of the same advantages. The financial aspect of unitizing is one such advantage. To the operators, the unit concept offers the ability to extract the reserve with fewer wells, thus lowering their capital investment. With less drilling sites set up there would also be less supervision and duplication of equipment. The surface and subsurface owners also have an advantage with respect to the unit financing. The unitization concept has the royalty payments being spread over a span of years so the royalty owners don't receive all of their proceeds from the drilling at one time.

A second advantage that both parties have seen develop is the increased coordination in the over-all recovery of the resource. The operating entities have been able to coordinate with one another through the Operators Agreement previously mentioned. The surface and subsurface owners have had their input in the Royalty Owners Agreement, as well as being able to preserve the original status of their land due to fewer drilling sites.

A third advantage the operating entities, the surface and subsurface owners, and the general public have had is the optimum possible recovery of the reserve. By unitizing, it becomes economically feasible to conduct an efficient

secondary recovery operation. Without this secondary recovery system, a very valuable quantity of the reserve could not be obtained.

PART 2. Disadvantages to the Surface and Subsurface Owners and Operating Entities

The disadvantages of the unitization concept are few. Since the maximum recovery is dependent on the unit concept, the disadvantages are small in comparison. The time and cost incurred in setting up and administering the unit could be viewed as necessary disadvantages. The operators may feel that having to work with competition in some cases is less than desirable. Likewise the individual surface and subsurface owners may look at the unitizing as a loss of personal freedom. The general public can see no disadvantage, since their concern is the complete recovery of any and all sources of energy.

PART 3. Brief History and Operational Record

Since the demand for oil and gas has been significantly greater in recent years than has the demand for coal, it stands to reason that the development of this industry is much ahead of the coal industry. The unitization concept was originally designed and tested in the late 1920's and early 1930's. In the early years, the oil and gas industry experienced a competitive and many times cutthroat approach to the capture of the natural gas and oil. As soon as one person would drill a well, the person or persons surrounding him would be forced into drilling very inefficient wells,

just to claim their portion of the reserve that may be beneath their land. Because of this type of an approach, it was very soon realized that legislative action was necessary to prevent this wasteful and expensive way of recovering these resources. Thus began the legislative processes in many states to have compulsory unitization in the oil and gas industry, the main purpose being the orderly recovery of oil and gas reserves. Montana's first statute concerning this unitization concept was initiated in the early 1950's and remains basically the same today.

As previously mentioned, this unit concept has been very well accepted in Montana. John Mack, with the Montana Power Company in charge of leasing arrangements, did convey that the Montana Power Company presently had two functioning units. He further explained that many reserves are small and isolated which prohibits the formation of any type of unit. Despite these small reserves, Mr. Richard Hug, Supervisor of the Oil and Gas Commission, said there are presently 76 functioning units in the state. These units are both independent and large companies such as Amoco, Texaco, and Farmers Union to name a few. The use of the unitization concept in this industry in Montana has been steadily increasing over the past 15 years. In fact a third level recovery operation is being considered for the first time in Montana, which is a result of the unit concept working for the optimum resource recovery.

SECTION II. APPLICATION TO MONTANA COAL INDUSTRY

SUBSECTION A. Schedule of Contacts

PART 1. Listing of Contacts

In reseraching the unitization concept both as it has applied to the oil and gas industry and how it may apply to the coal industry, numerous personal visits and phone contacts were made to persons having expertise in the area. These contacts included personnel in the oil and gas industry, both at the field exploration and administrative levels. Numerous contacts as well were made to regulatory agencies. Contacts were made with coal industry personnel to trace any existing unitizing and to explore the technical mining considerations that would affect possible unitization.

No existing unitization of coal field activity in the United States was identified. There are, however, varying types of agreements used that incorporate elements of the unit concept. The federal government is considering a plan called the "logical mining unit" for coal mining on federal land. This will be discussed later in this section.

A complete list of personal contacts made in the preparation of this report are shown here:

Howard Van Noy
Montana Power Company

Jay Johnson
Montana Power Company

John Mack
Montana Power Company
Supervision of Leasing Arrangements

L.C. Smith
Coastal States Gas Corporation
Senior Vice President

Loren Williams
Coastal States Gas Corporation
Vice President Research Exploration

Tom Finch
Montana School of Mineral Science
and Technology
Professor of Mineral Technology

James Landers
Continental Oil Company
Vice President, Production Department

Pete Slaybough
Continental Oil Company
Regional Supervisor

Jack Beckner
Peabody Coal Company
Manager, Environmental Quality Dept.

W.H. Oestreicher
Peabody Coal Company
Supervisor of Leasing Arrangements

John Gallagher
American Lurgi Corporation

Joe Maichel
Montana/Dakota Utilities
Attorney

Dave Phillips
Rocky Mountain Mineral Law Institute

Dale Zimmerman
Bureau of Land Management
Chief of Mineral Resource Div., D.C.

Wright Sheldon
United States Geological Survey
Assistant Manager, VA

Richard Hug
Montana Oil and Gas Commission
Supervisor

Tom Kryzer
Burlington Northern Railway
Vice President of Energy and Minerals Div.

Don Brelsford
M.H.D. Project Director

C. C. McCall
State Lands Department
Surface Mine Reclamation Division

Ed Stevens
Consolidation Coal Company
Regional Exploration Manager

Roger Tippy
Montana Legislative Council
Attorney

SUBSECTION B. Why Consider Coal Field Unitization Now?

PART 1. The Energy Crisis

If one can but study briefly the facts on world-wide known and potential fossil fuel reserves and the present and projected energy demands, it becomes clear that an energy crisis is imminent if not at hand. The recovery and processing of fossil fuels for utilization as a heat source is a procedure that cannot go on indefinitely. The technology needed to commercially harness renewable energy resources such as solar, wind, ocean or geothermal and to safely and effectively produce nuclear energy are still some years away. The interim period of time until this technology and the associated reasonable level of economics is reached will require some mining and use of the vast reserves of coal. Such uses may include gasification, liquefaction, magnetohydrodynamics, coal fired electrical generators or direct burning of coal. This emphasis on the use of coal has already placed great pressures on its recovery. The tonnage now being mined and the probable volumes to be mined cause an examination of all the procedures involved in getting the resource out of the ground and into an acceptably marketable form. One consideration is how surface and subsurface owners and operating entities are arranging for leases and production rights.

If in fact much coal is to be mined in Montana, a most important question then to be answered is what are the most efficient methods of mining, all factors being considered.

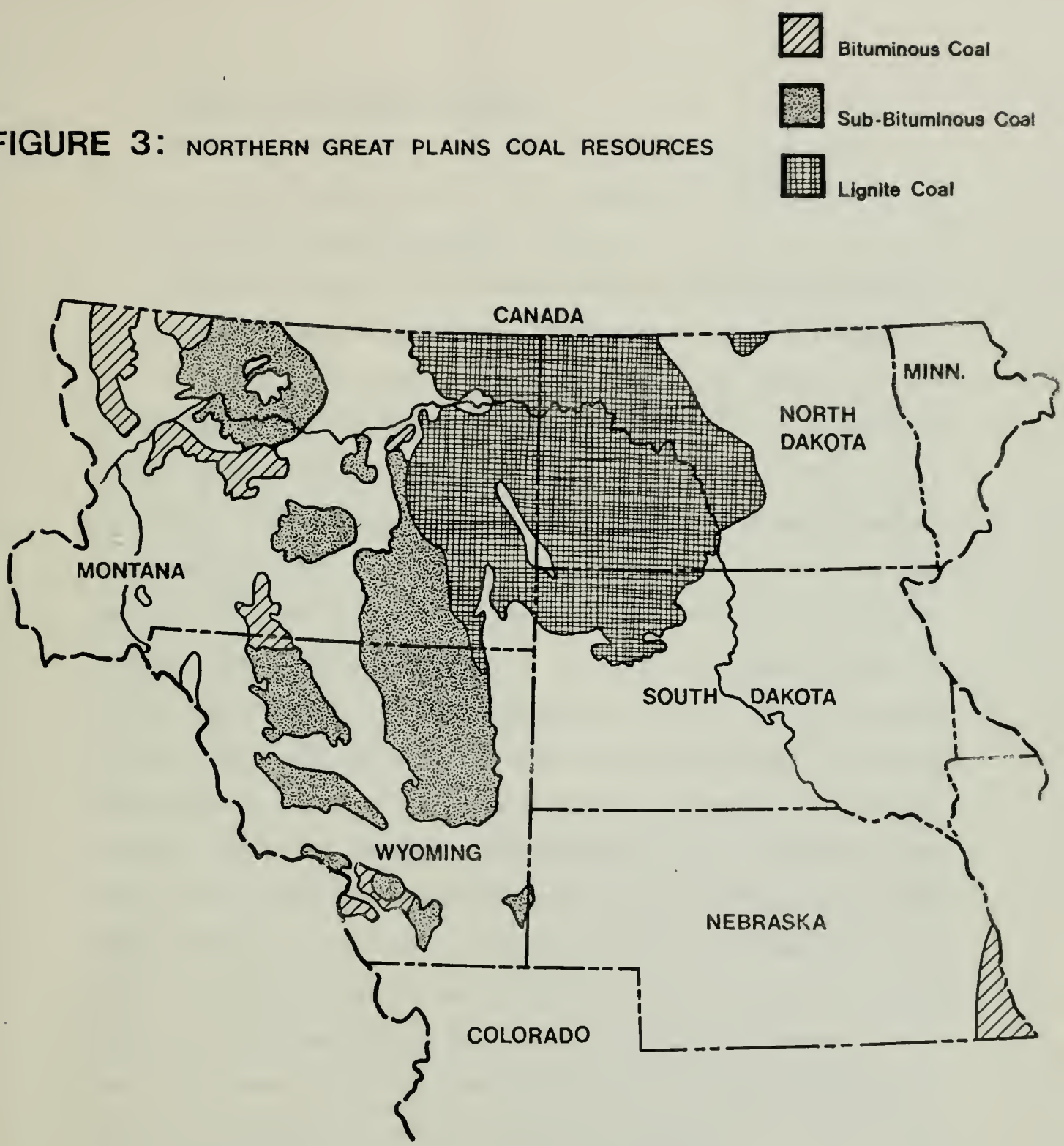
On this issue, the coal industry is drastically different from the oil and gas industry. The recovery of oil and gas does not require massive disturbing of the surface of the land, whereas strip mining procedures for coal mining is a major land use concern. Also important is the increased cost of the actual mining that is incurred by the operator. It is an easily understandable fact that strip mining and the subsequent reclamation of the land entails large capital investments.

Thus the general importance of energy at this point in time makes it imperative to examine all aspects of our coal extraction and usage procedures and policies. Unitization is one of those elements to analyze.

PART 2. Montana Reserves

The Fort Union Coal Area underlies a large part of eastern Montana. The state's strippable coal reserves amount to almost 43 billion tons. Figure 3 shows the general location and the type of coal in the Northern Great Plains, Montana included. The United States Bureau of Mines records indicate that Montana's strippable 43 billion tons is 50 percent of the strippable coal in this entire region. In addition, Montana has considerable sub-bituminous and some bituminous reserves that are deeper and potentially available but not by strip-mine procedures. Because of these huge reserves it is logical that the state consider concepts such as unitization that may enhance the best recovery of needed coal resources.

FIGURE 3: NORTHERN GREAT PLAINS COAL RESOURCES



Source: Project Independence Blueprint
Federal Energy Administration

PART 3. Ownership Patterns

Another reason for the consideration of coal field units for mine operations is the nature of the ownership of the surface and subsurface rights.

When one looks at the development of the coal industry in Montana, a readily apparent observation is the pattern of coal land ownership. Looking at ownership maps, it resembles that of a checkerboard. Figure 4 is an example of actual ownerships in McCone County. It is not at all uncommon to see ownerships on alternating sections throughout a township. The immediate problem with this type of ownership pattern is that in order to mine coal in the most efficient manner, the determining area of a single operation should be a natural boundary not a rectangular survey. The prohibiting factors here are the cost of physically setting up the mining operation as well as the geographical and geological layout of the coal field itself. Infrequently does a complete coal field lie within any one section of land. Even when the coal field does lie within one section, it is very possible that that one section may be owned by more than one owner. Since the coal land ownerships and leases do exist in these patterns, some type of blocking together or unitizing in order to recover the coal would seem logical.

PART 4. Is the Unit Concept an Answer?

In a paper written by J. Harley Williams for the 17th Annual Rocky Mountain Mineral Law Institute, he makes the following observations regarding oil and gas units.

Ownership A

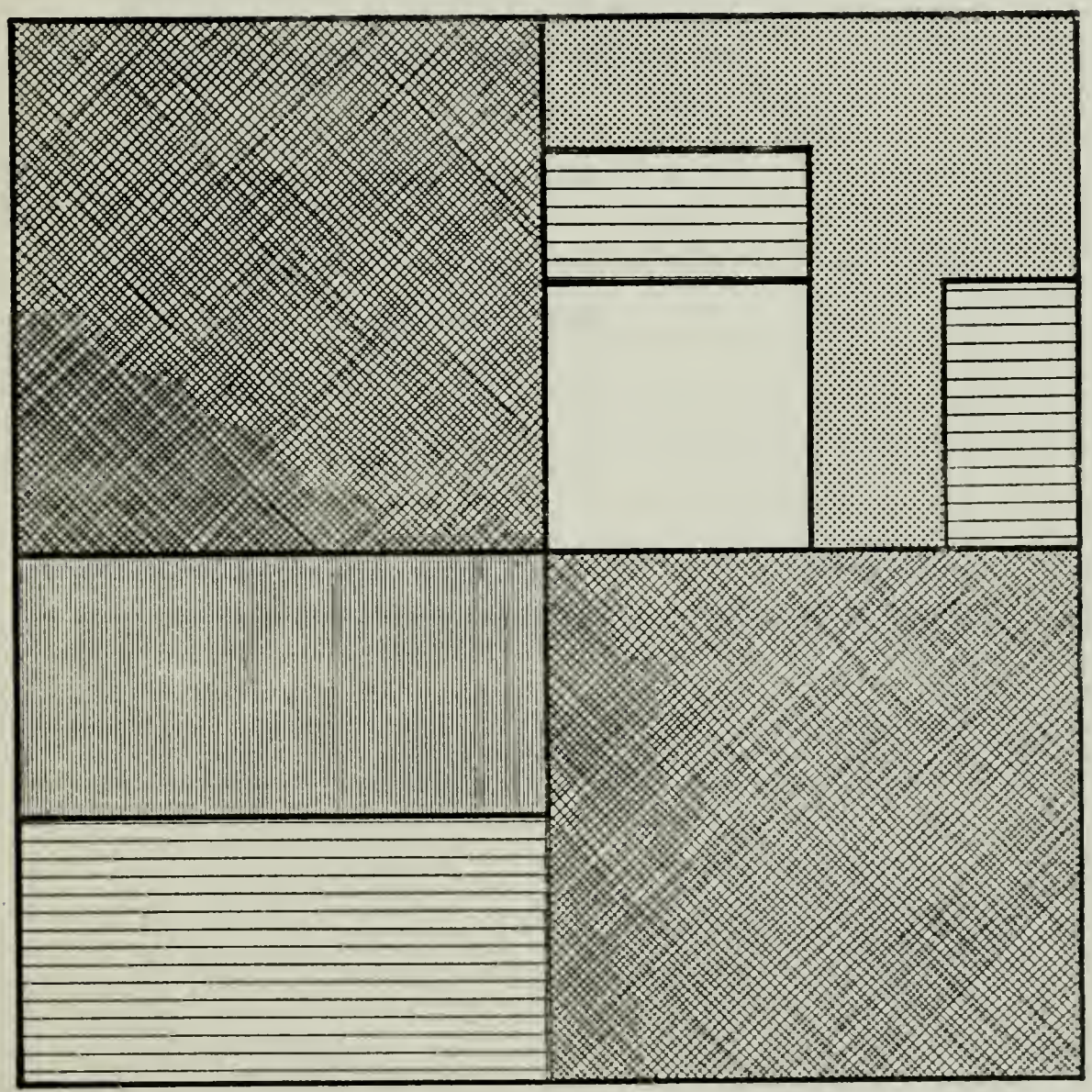
Ownership B

Ownership C

Ownership D

Ownership E

FIGURE 4



Source: T.A.P., Inc.

> If the problem of the correlative rights of . . . multiple owners were removed, operations could be conducted so as to conform to the unitary nature of the pool itself.
>
> This removal may be accomplished through the use of a unit agreement in which the multiple owners pool or consolidate their interests and agree to allow an operator or manager to operate the reservoir as a unit with an allocation of costs, expenses and production based on a formula. A joint account is usually established with charges and credits made to it on the basis of an agreed accounting procedure. Lease terms are usually modified so as to extend the leases until all production from the unit has ceased.

This same reasoning applies to the unitization of coal fields and mining operations.

IS UNITIZATION FEASIBLE TO THE SURFACE AND SUBSURFACE OWNER?

IS UNITIZATION FEASIBLE TO THE OPERATING ENTITIES?

SUBSECTION C. Is Unitization Feasible to the Surface and Subsurface Owner?

PART 1. Advantages

The advantages to the surface and subsurface owner in a coal unitization program would be very similar to the advantages available in the gas and oil industry. The unit agreement would insure the organization and the coordination of the conservation and reclamation aspect of the unit. A more complete description of the reclamation concept is contained in Section II, Subsection D.

Very closely related to the land reclamation within the unit is land use preservation. That is to say if there is a farm on one part of the unit, the farm could be mined to that particular farmer's interests, if in fact, those interests would correspond to the general plan of the unit. The advantage would be the farmer or rancher having a say in when and how his land would be mined. The unit concept is designed to meet the demands and the requirements of all the surface and subsurface owners within the unit, but one can easily see that there is no way there can be 100 percent agreement on all that would transpire within the unit. It is very important then for all the interests within the unit to realize that the decisions reached will not always be to their specific requirements, but that of the general concerns of the particular unit.

One additional advantage of the unit concept in the coal industry, as it is in the oil and gas, is the financial benefits one could experience. The surface and subsurface

owners could spread their payments over a period of years and not receive a large amount of income during that specific amount of time when the coal is actually extracted from their piece of land. This advance royalty system that would be incorporated in a unitization package is actually happening now. The advance royalty is being paid to the surface and subsurface owners, as opposed to being paid a delayed rental. The basic idea behind the advance royalty payments is that over a specified span of time, for example a 20- or 40-year period, the royalty payments would escalate so that at the end of the period, the surface and subsurface owner has been paid for the minerals extracted. Mr. W. H. Ostrecker, with the Peabody Coal Company, explained that as many as 90 to 95 percent of the leases that are now in existence are set up on the advance royalty plan. Also related to the financial aspect are some tax considerations that will be examined in Section II, Subsection G.

PART 2. Disadvantages

The disadvantages of the unitization concept in the coal industry would also parallel the disadvantages of the oil and gas. The consolidating of mineral owners to form a unit could be interpreted as losing some individual rights. An example of this has been previously noted. If a person wants something specifically done with his piece of land, but because it is not in the best interest of the unit, there is the possibility that he may have to forego his immediate requests for the good of the unit. Also, depending on how

the unitization concept would be set up, may require legislative action. If this were the case, much more regulative constraint would be imposed on the individual mineral owner than had previously been experienced. Looking at a basic outline for the development of a unit, it appears some unit inequity would have to be overcome.

For example, imagine four coal owners, each one owning a contiguous section of land. A unit is created and mining initiated in one area of that unit to progress in an orderly manner to the completion of the field. At the same time that all four owners are participating in their proportion of the royalties, as the unit concepts would have them do, the coal is being taken strictly from the one person's land. Mr. Ostrecker pointed out if there was ever a time that the mining were to cease, prior to the completion of the field, the person whose coal had been mined is now with no coal, but only a fourth of the profit. This problem would not have surfaced in the oil and gas, simply because the reserve is drained to the center of the unit and no one person is losing more than his share at any one time.

There was a possible solution to this problem discussed. Pete Slaybough, with Continental Oil, mentioned a concept known as cross assigning acreages. For example if those four owners take all four sections and incorporate them into a unit, then they would in turn have a 25 percent interest in the total unit. In other words, they would not own one section of land per se, but actually have one-quarter interest of the mineral rights of the entire unit.

If this were done, there would not be the situation where one person's coal has been completely extracted while another person's has not been touched.

This cross assigning of acreages could in itself be a disadvantage. The surface and subsurface owner may not be too willing to give up their land in exchange for a percentage of ownership in a larger unit of land.

Without doubt, the biggest concern of these surface and subsurface owners is the possible physical injury of the land incurred with mining operations. Adequate compensation for this injury would be required.

SUBSECTION D. Is Unitization Feasible to the Operating Entities?

PART 1. Advantages

In determining if unitization is applicable to the coal industry, it would be beneficial to examine closer how the concept functioned in the oil and gas industry and determine if any parallel advantages exist. Mr. J. H. Williams, Jr. discussed some of these comparisons in his paper.

> Ore bodies unlike oil and gas reservoirs are not homogeneous. The ore deposit usually varies from one area to another in thickness and grade or quality. The mining conditions encountered often vary greatly throughout an ore body thus affecting mining methods and costs. The ore is not fugacious as is oil and gas, and, therefore, an exact determination of its source may be made by a physical survey and proper accounting. Although the reprocessing of tailings bears some similarity, secondary recovery operations in oil and gas have no counterpart in mining.
>
> On the other hand, the consolidation of properties so as to reduce operating costs and capital expenditures is desirable in both operations as is the limiting of physical facilities such as shafts, wells, belt-lines and the like. Multiple ownership of properties is common to both with its attendant problems--although mining does not have the problem of drainage but, unlike oil, does have the problem of subjacent support. Both must have sufficient reserves to obtain profitable development.
>
> It would also result in permitting the orderly mining of the ore body in accordance with engineering principles without regard for the priorities that might otherwise exist for developing one lease before another and would avoid the conflict with lessors sometimes arising out of the failure to develop their lease first.

The reduction of operating costs and capital expenditures and the mining in accordance with engineering principles are two very significant advantages of unitizing. Each of these will be expanded.

It is very apparent that the economics of mining is the one critical variable that dictates to the operators whether or not they would be interested in forming a unit and in fact if they are interested in mining at all. The fewer times the equipment has to be relocated, the less capital investment and operating cost is then necessitated by the operator.

Figure 5 illustrates an area that may never be mined due to ownership (B), which in effect divides the coal field. If the surface and subsurface owner of this strip of land refuses to sign a lease, the coal deposits of ownership (A) may not be extracted either, since the mining operation would have to jump from one side of this strip to the other.

Once the mining operation has left this coal field, it will likely never return to extract this coal. Lands thus skipped would represent a wasteful and inefficient method of operation. On the other hand, if the unitization concept were in effect, the coal field could be mined in its entirety, as if there were no individual ownership boundaries.

This is further complicated by the fact that the operator is very dependent on the actual geographical layout of the coal field.

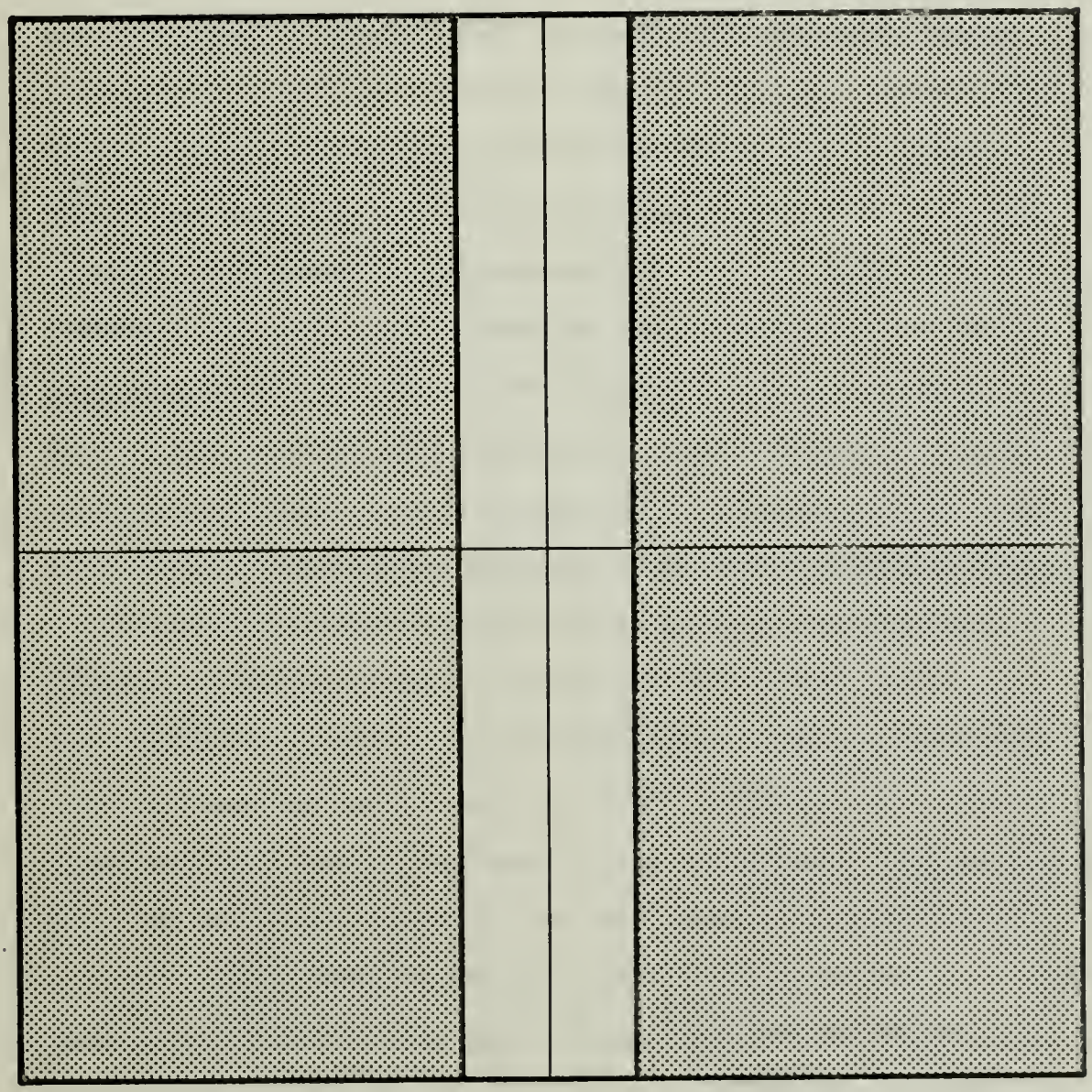


FIGURE 5

Source: T.A.P., Inc.

In visiting with Tom Finch, a Professor of Mineral Technology at the Montana School of Mineral Science and Technology in Butte, it was shown that there are a number of considerations that are very technical in nature, making it mandatory that the coal field be set up with the strictest compliance with geographic boundaries. A brief discussion of a few of these considerations may highlight the necessity for setting the coal fields up as they physically exist rather than trying to set them up according to ownerships. One consideration is the overburden which lies directly above the coal seam. This overburden must be as constant, in depth as possible. Fluctuations in the depth of the overburden results in mounds of spoil that will be left behind once the mining is complete. In fact, anything over a very slight fluctuation in overburden is a condition that cannot exist within a coal field, simply because there is no quick change capabilities. Once the mining equipment is set for a specific depth, it is not easily changed to accept the fluctuation. Transportation of the coal once it is mined is also a big consideration. The most common mode of transportation of this coal and the most practical from many aspects is the use of the railroad. The problem here is that there are not now railroads in existence in many of these areas where the coal would be mined. It would then be up to the operator or operators of the particular area to have a spur built into the coal fields so that the

coal could be transported. The building of spur lines to transport coal is a tremendously expensive proposition. The amount is near $250,000 a mile. It becomes readily apparent that a spur line of 15, 20, 25 miles at that cost would be very expensive.

One additional technical consideration is the problem with watersheds. If the coal field is not mined to the best possible compliance with geographic and engineering considerations, the watershed being a part of those considerations, it is conceivable that there would be excessive erosion occurring due to the watershed flow.

Mr. Finch went on to explain another aspect that actually enters into the mining considerations, although it is not actually in a technical level. The reclamation law requires a hundred foot edge surrounding the coal field to be unmined and not a part of the pit. With these unmined edges surrounding the pit for the reclamation purposes, the more pits that would be formed the more coal would have to be left to satisfy these requirements.

Mr. Williams also made note of some non-technical considerations. The two points are the 1) cross mining rights and 2) the commingling of ores.

Cross Mining Rights

> In the absence of specific authority, mine workings on one tract cannot be used to conduct mining operations on another. As a result, and in recognition of the unitary aspects of mining properties, many mining leases contain specific provision for the lessee's exclusive use of mine

haulage ways, mine shafts and other mining facilities on the leased premises in connection with mining operations on other lands. This rather simple device allows the consolidation of mining properties to the extent necessary to achieve one of the prime savings accomplished through unitization--that is the reduction of operating cost and the limiting of physical facilities necessary for mining operations.

Commingling of Ores

The oil produced from a reservoir is fungible and the royalties are usually stated as a fraction or percentage of value of the oil at the well head. In mining leases, the royalty is also usually computed on the basis of value but the point of valuation may vary from the mouth of the mine to any point in the processing of the ore.

In direct contract to oil, ores within the same ore body are not fungible but vary in grade or quality. Because of these characteristics, the courts have prohibited the commingling of ores owned by different parties without express authority.

When an ore body extends over lease boundaries or other property lines, the segregation of ores removed from the different properties often imposes a substantial burden on the operator. In some instances the blending of ores is advantabeous in the milling process. Therefore, some leases provide for commingling with other ores after separate weighing and sampling of the ore removed from the lease.

An alternative method of avoiding the problem of separate handling of ores is for the operator to obtain agreement from the various royalty owners allocating a certain percentage of the total mine production to each interest holder. This approach avoids multiple sampling, weighing and assaying as well as the related accounting and administrative costs.

In addition to the economic and mining advantages, the operating entities could benefit in using the unit concept to stabilize the lessor/lessee relationship.

If the surface and subsurface owner could see that there was a well-coordinated unit plan that had the schedule of mining laid out as to what was going to be mined and when,

and the financial arrangements also planned out, the operator would have a more stable unit. Seeing this organizational structure, the mineral owners would be less likely to withdraw their leases.

Tom Kryzer, with Burlington Northern, sees a couple different advantages. One might be the ability to sign not only the surface owners, but also the owners of subsurface mineral rights. With both owners in one unit, the activities that would affect one or the other could be coordinated. Still another advantage available to the operating entities in unitizing the coal industry would be that of a public relations tool. Having the surface and subsurface owners involved in the unit formation would give the operator the opportunity to plan the coal field development, taking into account the surface and subsurface owners' concerns.

Since the operator is responsible for reclaiming the land once the coal is mined, a coordinated and systematic program would be a definite advantage. The unit concept has that capability.

Since the boundaries of a unit are not dependent upon ownership, but rather on the boundaries of the most logical mining area, the reclamation that would follow the mining would also follow that particular geographical layout.

This approach to reclamation would be much more effective than attempting to do the reclaiming in a piece meal fashion. Many of the same considerations in the mining of an area

apply directly to the reclamation program. For example, it is inconceivable that the mining of a 40-acre field and then jumping to another 40-acre tract would be economically feasible. Likewise, the land reclamation requires the same coordinated approach. The moving and setting up of equipment and not being able to conform to the geographic layout of the land does not make for the best reclamation system.

PART 2. Disadvantages

The disadvantages experienced by the operators with the unitization concept would be few. The mere fact that the economics of mining dictates the forming of a minable block, means a unit must exist prior to initiating a mining operation. Since these minable blocks are already being put together, discussing the increased costs that would be incurred in forming the unit as being a disadvantage of the unitization concept is somewhat misleading. It is, however, important to point out that it is expensive and time-consuming to obtain the leases of the individual mineral owner and coordinate the formation of a mining block.

The formation of a unit can require a month for a small number of participants, or as long as three or four years to organize a large number of surface and subsurface owners. This increased time required is related to additional expense of the mining operation.

Once the unit is formed, there would be definite administrative considerations. These would include the coordinating of activities within the unit and making sure the royalty participation would be acceptable to all concerned.

The having to work with competition within a unit may be viewed as a disadvantage by some operating entities. Some of the same restraints and increased regulation experienced by the surface and subsurface owners would be felt by the operators. Working for the advancement of the unit would not always be to the operator's interests.

SUBSECTION E. Is Unitization in the Public's Interest?

PART 1. Public Advantages

Of prime concern in this day and age is the matter of energy, and especially the conservation of it. The unit concept in the oil and gas industry has been proven to be a more resource efficient manner of obtaining the raw material. The preceding sections have shown how the unit can also be advantageous in efficiency in the mining industry. Such applications of the unitization concept in mining can directly benefit the general public through the conservation of the coal. By recovering the coal in logical and economical blocks, the resource can be mined with a minimum of waste and at the minimum cost per ton.

Another major advantage to the unit that can be considered in the public interest is the capability of a more coordinated land disturbance resulting in fewer acres of land to be stripped and reclaimed. The reclamation efforts can be focused on a smaller area and would then likely net a better total effort ecologically. Certainly this minimization of environmental impact is in the best interests of the public. The coal field unitization concept addresses both conservation and reclamation. With the unit concept, these lands would in theory be mined and reclaimed in the most coordinated effort possible, as well as recovering the optimum amount of strippable coal.

PART 2. Public Disadvantages

There are some disadvantages of the unitization concept. The time and expense that is associated with the formation of a large unit could cause substantial delays in mining and in turn this relates to increased cost of the mining operation. This increased cost will be ultimately passed on to the consumer, the general public.

To allow the legal latitudes and provide the legal framework for the unit concept some form of enabling legislation would have to be drawn and passed. While this legislation is a positive "door opener" on one hand, it can be viewed by the public as another example of government regulation and associated bureaucratic interference. The power and authority to regulate and administer the unitization law means more government and more of what goes along with it, (rules, paperwork, red tape, taxes, etc.).

The loss of a certain amount of individual freedom to do as one pleases is also inherent in this concept and could be viewed as a public disadvantage. The formation of oil and gas units have in many states become compulsory, given a 50%+ agreement by involved owners. This can diminish the flexibility of an individual owner in the interest of increasing the operating efficiency of a group of owners. The pros and cons of voluntary versus compulsory participation in the unit will be discussed further in Subsection G.

SUBSECTION F. Alternatives

PART 1. Leave as Presently Exists

Mention should be made of possible alternatives to the further development of the unitization concept. The most obvious of these alternatives would be to do nothing, leave the situation as it presently exists. By leaving the situation as it exists presently, little would happen. The operating entities would continue to form some minable blocks, while many areas will be incomplete and un-minable. The surface and subsurface owners may agree to sign leases or they may hold out for more money or refuse to sell for sentimental reasons. The free enterprise system would eventually have the coal mined that was available, and the coal being held back would not be mined.

This approach would not insure the maximum recovery of a very valuable resource.

PART 2. Mandatory Unitization

A second alternative would be to impose a very strict unitization program in Montana. This would mean an area that was determined to be a minable unit, would be mined as a unit. It would be mandatory for all people with mineral rights in that area to become involved in the unit. This approach would probably require a legislative move to have mandatory unitization become a state statute.

Mr. Robert Tippy with the Montana Legislative Council explained that Montana did have a mandatory land condemnation statute in the early 1950's that remained in Montana until

1973, when it was amended. Presently there is no statute that governs the mandatory involvement in a mining unit by a person who does not wish to belong.

This approach would insure the maximum recovery of the coal reserves, since no coal could be withheld. There would, however, be a multitude of problems in enacting such a program. Many of these problems have been cited in this paper. Forced participation has many political and emotional aspects that must be weighed carefully.

PART 3. Voluntary Unitization

This third alternative would have the unitization concept utilized in those areas where it would be to the most advantage. The United States Geological Survey Department is presently developing and has rules proposed that would have logical mining units developed in areas having federal coal leases. This concept does have some interesting comparisons with the unitization concept. A summary of this proposed concept was published by the Bureau of Land Management in September of 1975.

> There are 533 Federal coal leases currently in existence, involving about 16 billion tons of recoverable coal reserves. Excluding leased reserves which are either uneconomic to develop or environmentally unsuitable, approximately half of the recoverable leased reserves have not been committed for future development The Department proposes to stimulate early production on these existing leases or if the lessees have no desire to develop the leases, to encourage early abandonment of the leases. These objectives will be pursued through two approaches:
>
> *Promulgation of diligent development and continuous operations regulations; and,
>
> *Incorporation of advance royalty requirements at the time of lease renewal.

> Diligent development regulations were published as proposed rule-making in the Federal Register on December 11, 1974. These regulations require the lessee to: incorporate his lease within a logical mining unit (LMU) within two years; file an approved mining and reclamation plan with the Mining Supervisor; and, as required by regulations, terms of the lease, and the Mining Supervisor, engage in the continuous operation of the mine or mines on the lease. The lease can be terminated if the lessee does not diligently develop his lease. After review of public comments received on the proposed rulemaking described above, the Department expects to promulgate final diligent development regulations. An EIS, if warranted, will be prepared subject to NEPA prior to the promulgation of such regulations.
>
> Advance royalty requirements--to encourage diligent development and continuous production--will be imposed on the lease at the time of lease renewal. Advance royalties will be based on an assumed schedule of production which should exhaust the leased deposit in 40 years.

An expanded definition of the logical mining unit was contained in the December 31, 1975, issue of the Federal Register.

> (d) Logical Mining Unit (LMU). A Logical Mining Unit or LMU is an area of coal land that can be developed and mined in a efficient, economical and orderly manner with due regard to the conservation of coal reserves and other resources. An LMU may consist of one or more Federal leasholds, and may include intervening or adjacent non-Federal lands, if all lands are under the effective control of a single operator and can be developed and operated as a unified mine.

The logical mining unit concept has been in various stages of development for the past four years. The present status of the LMU is that of proposed rules awaiting final approval. A complete listing of all pertinent proposed rules concerning the logical mining unit concept can be

seen in the September 5, 1975, publication of the Federal Register. Amendments to these proposed rules were written up in the December 31, 1975, issue of the Federal Register.

This concept being formalized by the Geological Survey does not have all the answers for the entire coal industry in Montana, but does offer some concrete ideas. It does not, however, make it mandatory for non-federal leases adjoining the federal deposits to join the unit, nor does this concept address itself to areas having no federal coal at all. These latter areas would require an independent arrangement for unitization.

SUBSECTION G. Unitization Impacts that Need Further Examination.

PART 1. Voluntary Versus Compulsory Participation

As pointed out in earlier parts of this report, there are considerations in the unit concept that indicate that after a reasonable amount of agreement by involved owners and operators, probably compulsory participation is necessary. Such compulsory unitization has been common in most oil and gas producing states for many years. For the unit advantages to be fully realized by the owners, operators, and the public as a group total participation is necessary.

The state of New Mexico has a statute that has been in effect since 1967 that speaks to compulsory unitization in the mining industry. It was patterned after similar laws in the oil and gas industry. Considerable time is afforded to properly document the reasons and the plan for the unit. Hearings and investigations are specifically called for. Because of this relatively thorough and involved process, the concept appears not to infringe upon constitutional rights of individuals.

In Montana some precedent has been set by the initiation of the compulsory unit concept in the oil and gas industry. However, the regulatory disadvantages of compulsory unitization and the idea of even a voluntary unit in a coal field application has yet to be drafted and discussed and tested. More needs to be done in assessing the complete advantages and disadvantages and effectiveness of voluntary and compulsory unitization.

PART 2. Taxation

The direct monetary tax benefits to an owner of being able to spread net proceeds from the sale of coal over a period of years are obvious. This factor is an advantage in the overall evaluation of the concept of the unit. The specifics as to how much of a good thing it is depend upon many variables. Factors from individual circumstance, to the price of coal, to time frame must enter in before the effect can even be estimated. Beyond the mere statement that it is an advantage, much needs to be done to accurately indicate how this effects the parties involved. With substantial example work this tax benefit could be an important point in selling the entire unitization concept. Additional investigative work is necessary here to bring out the assets and the liabilities of the taxation question under present Montana and federal law.

PART 3. Participation Formulas

This is an area that is of vital importance to the parties to any unit agreement. The amount or percent of participation in the production and in the costs and revenues from a unit is usually the most difficult single element to finally negotiate. Mr. J. Harley Williams in his article discussed the problem as it relates to oil and gas units.

> The most difficult problem to solve in the formation of an oil and gas unit where a large number of mineral owners are involved is the formula to be used

in allocating the production of minerals from the unitized area. It is here that the decision to unitize is often rejected. The ideal which the drafter of such a formula should attempt to achieve is that each participant in the unit be given that amount of unit production which is in exact proportion to the contribution which he makes to the unit. However, with human nature being what it is, each participant tends to overstate his contribution and the formula will probably result from the give and take of compromise.

A common method for allocating production in the oil industry has been to allocate that amount of production to each participant which bears the same ratio to total production from the unit area as the number of surface acres contributed by the participant bears to the total surface acres contained in the unit area. This method is particularly appropriate when the allocation is being made prior to the exploration of the lands within the subject unit area, and, therefore, prior to any specific knowledge as to ore deposits in the subject lands.

When the property has been sufficiently explored or developed to allow for the estimate of recoverable reserves, the formula is usually drawn in the oil industry using this as its basis. In this instance, the participant receives that amount of production which bears the same ratio to total production as the estimated total recoverable reserves contributed by the participant to the unit bears to the total contained in the unit. In mining operations, this approach would be practical after close space drilling had been completed.

In some large units, the determination of this ratio is often left to be accomplished after exploration has occurred. In addition, it sometimes varies within designated participating areas within a unit.

Occasionally the mineral interest owners are unable to agree on an allocation formula and the oil is distributed to the owners of those tracts where it is actually produced. This is known as a divided unit. This is usually a very unsatisfactory arrangement particularly because of the fugacious nature

of oil and gas. Although many of the advantages of unitization would be lost in this type of allocation method, in mining operations it might not prove quite as unsatisfactory as in oil and gas operations if proper sampling and accounting procedures were established prior to the commingling of the ore.

This key area of necessary agreement in the successful setting up of a unit needs additional research in order to be able to make some recommendations as to how coal proceeds could be allocated. The methods of geological determination of tonnages and quality needs to be defined. The relationship of total acres, overburden, reclamation, and other costs of extraction need to be considered. Before the unitization of Montana coal fields is presented as the way to go, this participation formula should be researched.

PART 4. Legislative Requirements

Once the unit concept in coal mining is judged to be a viable idea for Montana, the work needs to begin on the drafting of enabling legislation. The existing Montana oil and gas laws and regulations can form a base from which to begin legislative research. In addition there has been similar work done in New Mexico and several other states that would help in drawing up a Montana statute. There would necessarily be numerous sections of such enabling law that would have to be specific to the local circumstances, much research is needed here.

Another good source of background and pertinent legal information is the library at the Rocky Mountain Mineral Law Institute in Denver Colorado. Here there are several

efforts at example mining lease unit agreements on file. The work that has been done by the federal government on logical mining units would also be valuable and is likely available.

SECTION III. RECOMMENDATIONS & CONCLUSIONS

SUBSECTION A. Present Recommendations

1. The concept of coal field unitization in Montana appears viable and should continue to be pursued.

2. Interview and discuss the unit mining concept with surface and subsurface owners and operating entities in Montana.

3. Research and analyze existing mining unit agreements in other states.

4. Explore the key area of participation formulas with specific regard to the Montana Coal situation.

5. Explore the key area of voluntary and compulsory unitization.

6. Explore the key area of state and federal taxation regulations.

SUBSECTION B. Future Recommendations

1. Obtain the support for mining unitization from those individuals, groups and agencies that can clear the way for enabling legislation.

2. Take steps necessary to formulate and present the enabling legislation to Montana lawmakers in 1977.

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